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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/810,505	03/26/2004	Eri Kojima	5271-0113PUS1	8177

2292 7590 04/25/2007  
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FALLS CHURCH, VA 22040-0747

EXAMINER
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ALEJANDRO, RAYMOND

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/25/2007	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/25/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

Application No.

10/810,505

Applicant(s)

KOJIMA ET AL.

Examiner

Raymond Alejandro

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 10 April 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 1-19 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 06/25/04 & 04/10/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

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## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of Group II and Species (claims 20-32) in the reply filed on 04/10/07 is acknowledged.

### ***Priority***

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

### ***Information Disclosure Statement***

3. The information disclosure statements (IDS) submitted on 06/25/04 and 04/10/07 were considered by the examiner.

### ***Drawings***

4. The drawings were received on 03/26/04. These drawings are acceptable.

### ***Specification***

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

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The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 21 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. The language “assuming that highest peak intensities of diffraction lines” in claims 21 and 29 is found to render the claim vague and indefinite because a claim limitation cannot be based on an assumption. A claim must refer to a clear, concrete and unambiguous limitation.

*“Although an essential purpose of the examination process is to determine whether or not the claims define an invention that is both novel and nonobvious over the prior art, another essential purpose of patent examination is to determine whether or not the claims are precise, clear, correct, and unambiguous. The uncertainties of claim scope should be removed, as much as possible, during the examination process.” See MPEP 2171 Two Separate Requirements for Claims Under 35 U.S.C. 112, Second Paragraph.*

#### ***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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10. Claims 20-21, 23, 25-26 and 29-32 are rejected under 35 U.S.C. 102(e) as being anticipated by Tamura et al 2003/0180619.

The present claims are geared toward a non-aqueous secondary battery wherein the disclosed inventive concept comprises the specific intermetallic compound active material and the protective layer.

As to claim 20:

Tamura et al disclose a rechargeable non-aqueous lithium battery comprising an anode, a cathode and a non-aqueous electrolyte (P0020/CLAIM 18). The negative electrode has a current collector and a thin alloy film provided thereon and composed of a metal which alloys with Li such as Sn, Ge, In, Al, Si and like (CLAIM 1/P0008) and a metal which does not alloy with Li such as Cu, Fe, Ni, Mn, Co, Mo, W, Ti, Zr and the like (P0009-0010/ CLAIM 1). The thin alloy film forms an intermetallic compound useful as the active material (P0008, ABSTRACT).

Tamura et al specifically exemplifies intermetallic compounds formed of an alloy of Sn-Co, Sn-Ni, Sn-Fe, Sn-Pb and Sn-Zn (P0048, 0059-0063/TABLE 3-4) and Sn-Ni-Co (P0074-0075).

Further disclosed is the formation of a mixed layer components of the current collector and the alloy at an interface between the current collector and the thin film alloy (P0019/See CLAIM 17). *Since the mixed layer is formed of components of either or both the current collector and the alloy film, it is to be noted that it contains at least one of Ti, Ni, Zr, and/or W.*

As to claims 21 and 29:

The specific X-ray diffraction measurement is deemed to be an inherent characteristic or property of the negative electrode components. Accordingly, products of identical chemical

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composition can not have mutually exclusive properties, and thus, the claimed property (i.e. X-ray diffraction measurement), is necessarily present in the prior art material.

*"Products of identical chemical composition can not have mutually exclusive properties." A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).*

***See MPEP 2112.01 [R-3] Composition, Product, and Apparatus Claims***

As to claim 23:

Further disclosed is the formation of a mixed layer components of the current collector and the alloy at an interface between the current collector and the thin film alloy (P0019/See CLAIM 17). *Since the mixed layer is formed of components of either or both the current collector and the alloy film, it is to be noted that it contains at least one of Ti, Ni, Zr, and/or W.*

As to claims 25-26:

Element which does not alloy with Li are Cu, Fe, Ni, Mn, Co, Mo, W, Ti, Zr and the like (P0009-0010/ CLAIM 1).

As to claims 30-31:

Thickness of the thin alloy film is about 2  $\mu\text{m}$  (P0031, 0059, 0069-0070, 0074/See EXPERIMENTS 1-5). *Thickness is taught with sufficient specificity.*

As to claim 32:

Current collector is made of C, Ni, Ti, and/or Fe (P0012/P0031, 0059, 0069-0070).

Thus, the present claims are anticipated.

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11. Claims 20-22 and 24-32 are rejected under 35 U.S.C. 102(b) as being anticipated by the Publication “*Study on the anode behavior of Sn and Sn-Cu alloy thin film electrodes*” by Tamura et al (herein called Tamura et al). [**Note:** Tamura et al was published in 2002, see front page thereof and as annotated by the applicant on page 2 of the 06/25/04 IDS. Thus, Tamura et al is a 102(b) reference with respect to applicant’s effective filing date of 03/26/04].

As to claims 20 and 22:

Tamura et al disclose Li-ion batteries comprising an anode, a cathode and a non-aqueous electrolyte (See **1. Introduction & 2.4 Preparation of a Small Cell**). **Figure 8(b)** of Tamura et al illustrates an anode structure comprising a Cu-foil (the current collector) and a Cu-Sn-like phase first layer, and a  $\text{Cu}_6\text{Sn}_5$  second phase layer (See **FIGURE 8(b)**). Specifically, Tamura et al reported the formation of at least 2 layers including different phases of an intermetallic compound of Sn-Cu (See **3.3 Heat Treatment effects on the structures of the active materials**). *In this case, the  $\text{Cu}_6\text{Sn}_5$  second phase layer represents the active material layer and the Cu-Sn-like phase first layer represents the protective layer. The Sn-Cu phase layers have different compositions.*

As to claims 21 and 29:

The specific X-ray diffraction measurement is deemed to be an inherent characteristic or property of the negative electrode components. Accordingly, products of identical chemical composition can not have mutually exclusive properties, and thus, the claimed property (i.e. X-ray diffraction measurement), is necessarily present in the prior art material.

*“Products of identical chemical composition can not have mutually exclusive properties.” A chemical composition and its properties are inseparable. Therefore, if the prior*

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*art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present. In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).*

***See MPEP 2112.01 [R-3] Composition, Product, and Apparatus Claims***

As to claim 24:

Tamura et al reported thicknesses of less than 0.5 $\mu$ m or less than 500 nm (See description of FIGURE 8, at the bottom of page 52 & 3.3 Heat Treatment effects on the structures of the active materials).

As to claims 25-26:

Tamura et al employ Cu as the element that does not substantially react with Li (See FIGURE 8(b), 3.3 Heat Treatment effects on the structures of the active materials and TITLE)

As to claims 27-28:

Tamura et al shows a Cu<sub>6</sub>Sn<sub>5</sub> second phase layer (See 3.3 Heat Treatment effects on the structures of the active materials and FIGURE 8(b)).

As to claims 30-31:

Tamura et al reported thickness of 0.5 $\mu$ m and 2  $\mu$ m (See 2.1 Preparation of an electrodeposited tin anode without/with heat treatment; 2.4 Preparation of a Small Cell & 3.3 Heat Treatment effects on the structures of the active materials)

As to claims 32:

Tamura et al use a Cu-foil as the current collector (See 3.3 Heat Treatment effects on the structures of the active materials; 1.Introduction on page 49 and FIGURE 8(b))

Thus, the present claims are anticipated.



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*Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Raymond Alejandro  
Primary Examiner  
Art Unit 1745

  
RAYMOND ALEJANDRO  
PRIMARY EXAMINER